THE Canadian Geological Survey has published the second part of vol. iii. of its monographs on "Palæozoic Fossils," in which Mr. Whiteaves describes and figures fossils—chiefly Gastropods and Brachiopods—from the Guelph and Hudson River formations.

WE have received from Mr. J. H. Knowles, of Lavender Hill, S.W., a catalogue of various books of science which he has for sale. Many interesting and valuable works on Ornithology, Botany, Astronomy, and other sciences are included.

MESSRS. JARROLD AND SONS have just published an abridged edition of "The Official Guide to the Norwich Castle Museum," at the small price of sixpence. The chief author of the book is Mr. T. Southwell, who has produced a work that should be in the hands of all visitors to the museum, which it so well describes. The little work is admirably compiled, and is illustrated by numerous figures in the text.

THE valuable series of reprints now being published by Mr. Engelmann, of Leipsig, under the title of Ostwald's "Klassiker der Exakten Wissenschaften" has recently had four more volumes added to it. These, numbered 63 to 66, contain respectively the following papers:—"Zur Entdeckung des Elektromagnetismus," by H. C. Oersted and T. J. Seebeck; "Über die Vierfach Periodischen Functionen Zweier Variabeln," by C. G. J. Jacobi; "Abhandlung ueber die Functionen Zweier Variabler mit vier Perioden," by G. Rosenhain; and "Die Anfänge des Natürlichen Systemes der Chemischen Elemente," by J. W. Doebereiner and Max Pettenkofer.

WE have received part i. vol. vi. of the *Transactions* of the Norfolk and Norwich Naturalists' Society, by which it appears that the Society has just completed its twenty-sixth year, and to be financially in a prosperous condition; now numbering 275 members, amongst whom we recognise many well-known names. The presidential address, by Dr. Plowright, was mainly devoted to the consideration of some obscure points in the life-history and development of the various forms of *Puccinia*, which he showed had by no means been worked out, and indicated the direction in which further investigations should be pursued. Amongst the papers read before the Society, and published in their *Transactions*, is a very interesting one on "Neolithic Man in Thetford District," with illustrations of the various types of flint implements found in the river-gravels of that neighbourhood. The usual "Report on the Herring Fishery of Yarmouth and Lowestoft" is also published, which having been continued for fourteen consecutive years, in the absence of trustworthy statistics on the subject elsewhere, should be possessed of value; and the same may be said of the very full meteorological notes by Mr. A. W. Preston. A chatty paper on "Old-time Yarmouth Naturalists," by Mr. F. Danby-Palmer, should also be mentioned as giving some particulars of the more noticeable of the old-time naturalists, for which that ornithologically rich section of the east coast has always been remarkable. There are fifteen published papers in all, each of which speaks well for the vitality and usefulness of the Society.

THE additions to the Zoological Society's Gardens during the past week include two Bonnet Monkeys (*Macacus sinicus*, ♀ ♀) from India, presented respectively by Mr. Thomas Mackenzie and Messrs. Davies and Sons; a Chimpanzee (*Anthropopithecus troglodytes*, ♂) from West Africa, presented by Captain G. C. Denton; a Piping Guan (*Pipile cumanensis*) from Uruguay, presented by Mr. P. du Pré Grenfell; four Green Lizards (*Lacerta viridis*), three Wall Lizards (*Lacerta muralis*), European, presented by Mr. C. W. Tytheridge; two Laughing Kingfishers (*Dacelo gigantea*) from Australia, deposited; a Common Seal (*Phoca vitulina*) from Scotland, purchased.

OUR ASTRONOMICAL COLUMN.

RETURN OF FAYE'S COMET.—A telegram from Kiel, received on September 28, announces that Faye's comet was observed by Javelle at Nice on the 26th. At 12h. 34·8m., Nice time, it was in R.A. 21h. 8m. 11s., and Decl. 1° 54′ S. It is accordingly well situated in the north-western part of the constellation Aquarius, crossing the meridian a little before 9 p.m. At the time of observation it was noted as "feeble."

ELEMENTS AND EPHEMERIS OF COMET *a*, 1895 (SWIFT).—Dr. Berberich has computed the following new elements of Swift's comet, from observations made at Mount Hamilton, August 21; Nice, August 31; and Strassburg, September 16.

These elements represent the comet's orbit with a greater degree of accuracy than those previously deduced, and the ephemeris determined from them closely represents observations made at Paris. In continuation of the ephemeris given in NATURE of September 5, we print the following, from *Edinburgh Circular* No. 46:—

T = 1895, *Aug.* 20, 88480 *M. T. Berlin*

$$\left.\begin{array}{rcl} \pi - \text{☊} & = & 167^\circ\ 47'\ 7''\cdot8 \\ \text{☊} & = & 170\ 16\ 17\cdot3 \\ i & = & 2\ 59\ 24\cdot9 \end{array}\right\}\ 1895\cdot0 \qquad \begin{array}{rcl} \mu & = & 502''\cdot654 \\ \log a & = & 0\cdot565825 \\ \log q & = & 0\cdot112686 \end{array}$$

$$\phi = 40\ 22\ 17\cdot6 \qquad \text{Period} = 7\cdot059 \text{ years.}$$

Ephemeris for Berlin Midnight.

1895.	α app. h. m. s.	δ app. ° ′	Brightness.
Oct. 2	1 24 7	+4 32·9	
4	1 24 41	4 23·9	0·62
6	1 25 9	4 15·3	
8	1 25 31	+4 7·1	0·56
10	1 25 50	+3 59·5	
12	1 26 6	3 52·5	0·50
14	1 26 19	3 46·2	
16	1 26 31	3 40·6	0·44
18	1 26 42	3 35·8	
20	1 26 53	3 31·9	0·38
22	1 27 5	3 29·0	
24	1 27 19	3 27·0	0·33
26	1 27 35	3 25·9	
28	1 27 53	+3 25·7	0·29

It will be noticed that the comet is diminishing in brightness, and on October 12 will only be half the brightness at the time of discovery, August 20.

γ VIRGINIS.—Of the many double-star orbits which have recently been computed by Dr. See, of Chicago, none presents more features of interest than that of γ Virginis. This famous double star has been very persistently observed since its discovery in 1718, but none of the orbits previously determined are consistent with the most recent observations. Including some of his own measures, Dr. See finds the following elements (*Astronomical Journal*, No. 352):—

$$\begin{array}{rcll} P & = & 194\cdot0 & \text{years} \\ T & = & 1836\cdot53 & ,, \\ e & = & 0\cdot8974 & ,, \\ a & = & 3''\cdot989 & \end{array} \quad \begin{array}{c} \ldots \\ \ldots \\ \ldots \\ \ldots \end{array} \quad \begin{array}{rcl} \Omega & = & 50^\circ\cdot4 \\ i & = & 31\cdot0 \\ \lambda & = & 270\cdot0 \\ n & = & 1\cdot8557 \end{array}$$

Apparent orbit:

Length of major axis = 6″·824
,, ,, minor axis = 3″·530
Angle of major axis = 140°·4
,, ,, periastron = 140°·4
Distance of star from centre = 3″·062

A comparison of computed and observed places shows, according to Dr. See, that these elements are probably the most exact yet found for any binary star. It will be seen from the figures given that the line of nodes coincides with the minor axis of the real ellipse, which is also the minor axis of its projection; and, owing to the small inclination, the apparent ellipse is only slightly less eccentric than the real ellipse, so that the foci of the two ellipses nearly coincide. Dr. See points out that one of the consequences of this disposition of the orbit is to make the movement of the radius vector in the apparent orbit very little different from that in the real orbit, so that γ Virginis furnishes the best test we have for the exactness of the law of gravitation in stellar systems. "If there is any deviation from the Keplerian law of areas, it must be extremely slight. There-

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fore the force is certainly central, and if it differs at all from the law of Newton, the deviation must be relatively unimportant."

The orbit is also remarkable for its great eccentricity, which surpasses that of any known stellar orbit.

For many years to come the angular motion will be very slow, and Dr. See draws attention to the fact that observations of distance will be more valuable than angular measures in effecting a further improvement in the elements.

THE THIRD INTERNATIONAL ZOOLOGICAL CONGRESS AT LEYDEN.

FROM first to last this Congress, the Session of which lasted from September 15 to 21, was favoured by exceptionally fine autumn weather, and the quaint old town of Leyden, where the meeting was held, as well as the island of Marken, the Zoological Park at Graveland (where apteryx thrives and gnus are kept in free pastures), the Zoological Station at Helder, the sea-beach of Katwijk and Scheveningen, and the port of Rotterdam, to all of which places excursions were organised, were under these circumstances seen at their very best.

The character of the meeting was eminently international. The daily bulletin, although edited in French, contained announcements of lectures to be held and of papers to be read in English and in German, and in the Sections these three different tongues often succeeded one another rapidly and fraternally.

On the Sunday evening preceding the official opening there had been an informal mustering of the forces then already assembled, and Prof. Hubrecht, of Utrecht, who, as President of the Netherlands Zoological Society, gave a hearty welcome to those present, hinted at the inadvisability of allowing the use of more than these three languages.

Still, besides forty-two representatives from Great Britain and the United States, sixty-three from France and Belgium, and twenty from Germany and Austria, there were no less than eleven Russians, eight Scandinavians, and sixty-four Dutchmen inscribed as members, who had to restrict the use of their native language to conversation among themselves.

The total number of members inscribed was 232, and not only the number but also the quality of the zoologists assembled was such as to make this international gathering really a very representative one, which served to bring together some of the veterans of the old guard, and a great number of the younger generation of zoologists.

A glance along the list of those that were present will show this at once. There we find Jul. Vict. Carus, Th. Eimer, V. Hensen, A. Metzger, F. E. Schulze, R. Semon, J. W. Spengel, R. Virchow, Aug. Weismann, K. Grobben, Ch. Julin, E. de Sélys Longchamps, C. Lütken, H. Field, O. C. Marsh, W. B. Scott, C. W. Stiles, R. Blanchard, E. Bouvier, A. Certes, A. Milne-Edwards, E. Perrier, L. Vaillant, J. Anderson, Sir W. H. Flower, S. J. Hickson, John Murray, Adam Sedgwick, R. B. Sharpe, R. Trimen, d'Arcy Thompson, S. Apathy, S. Brusina, C. Emery, R. Collett, A. Kowalevsky, W. Schimkevitch, W. Salensky, W. Blasius, N. Zograff, W. Leche, F. A. Smitt, Th. Studer, van Wyhe, Max Weber, Vosmaer, Sluiter, van Rees, Lidth de Jeude, Kerbert Jentink, Hubrecht, Hoffmann, Hoek, Horst, Everts, Büttikofer, M. C. Dekhuyzen, E. Rosenberg, and van Bemmelen. Very many of these read papers in the Sections, three of them (John Murray, A. Milne-Edwards and Weismann) addressed general meetings; whereas on the Tuesday evening a lecture on the curiosities of bird life, illustrated by coloured lantern-slides, was given by Dr. Bowdler Sharpe, of the British Museum, and was attended by the young Queen and the Queen-Regent.

The Committee of Organisation, to whose excellent arrangements much of the success of the meeting was due, were Prof. Hubrecht of Utrecht, Dr. Jentink, Director of the Natural History Museum, Leyden (President of the Congress), Dr. Hoek (Secretary), and Dr. Horst (Treasurer).

There were six different Sections, a new feature of which was the inclusion of palæontology with recent zoology. There was no separate Palæontological Section.

In the first Section (general zoology, geographical distribution, with the inclusion of fossil faunas and evolution theory), Mr. A. Sedgwick, of Cambridge, gave an exposition of his views concerning direct cellular continuity in the living organism. In a later meeting of the same Section, Prof. Apathy, of Klausenburg (Hungary), demonstrated a series of the most beautiful and delicate microscopical preparations, which, already at an earlier date, have led him to conclusions very similar to those of Sedgwick just referred to.

Prof. Hensen, of Kiel, gave an interesting account of the Plankton expedition, its aims and its results.

Prof. Eimer, of Tübingen, spoke in this Section on the subject of orthogenesis, and on the impotence of natural selection for the production of new species.

In the second and third Sections, devoted to living and extinct vertebrates, their anatomy and embryology, papers were read by Profs. Zograff of Moscow, Vaillant, O. C. Marsh, Büttikofer, Lütken, Leche, Semon, Hubrecht, and van Bemmelen.

The fourth, fifth and sixth Sections embraced the invertebrates, one of them being specially devoted to entomology. Messrs. Wardell Stiles (from the United States), Hickson, Blanchard, Goto (from Tokyo), Perrier, Kowalevsky, Schimkevitch, Gilson, Salensky, and Julin were among the principal speakers in these Sections.

The sectional meeting which proved to be the most attractive was the one that was held on the last day of the meeting, when in the second Section, temporarily presided over by Rudolf Virchow, Dr. E. Dubois, the indefatigable naturalist, who has devoted the last six years to the collection of palæontological specimens in Sumatra and Java, gave a full account of the finding of the remnants of his *Pithecanthropus erectus*.

The four fragments (a femur, the upper part of a skull, and two teeth) upon which this new species, looked upon by its author as an intermediate stage between the anthropoids and man, was founded, were laid before the Section, together with a good many pieces intended for comparison. A most interesting discussion followed, in which Virchow, O. C. Marsh, Emil Rosenberg, Sir William Flower and Prof. Martin took a prominent part. Virchow's contention was that the four fragments did not belong to the same animal. He attempted to derive arguments from pathological anatomy, which would show that the osteophytic outgrowths of the femur described by Dubois were indications tending rather towards the human than towards the simian origin of the femur. Nevertheless, he spoke in a very appreciative tone, telling the Section that he had only wished to put in a point of interrogation where Dubois' affirmations did not appear to him to be as yet fully justified.

Prof. Marsh was inclined, on grounds derived from his vast experience in palæontological excavations, to support many of Dubois' conclusions. He had noticed exostoses of a similar nature as those of Pithecanthropus in fossil animals of quite different orders. He pointed out the necessity of carefully comparing these remains with those from the Sivalik Hills.

Prof. Rosenberg, considering more especially the femur and the cranium from the point of view of the anatomist, tried to show that the four characteristics, by which Dubois separates the femur of Pithecanthropus from that of man, are found also in human femora, in some few cases even all of them combined. The skull, on the contrary, is more that of a primate; but he did not agree with Dubois' argument that certain peculiarities of its *planum nuchale* tended to show that the animal had assumed a more erect gait. Very similar peculiarities are found in the New-World Cebus, which moves on all fours. Rosenberg acknowledged, however, that the high intrinsic value of the fragments was in no way diminished by the doubts expressed by him, because the femur, even if human, would prove Tertiary man to have existed in Java, the origin of man being thus pushed further back towards the earlier Tertiary period.

The results of this discussion, though not a decisive triumph for Pithecanthropus as a valid species, was a unanimous recognition of the great importance of Dr. Dubois' researches.

Another interesting afternoon lecture, which attracted numerous members of different Sections, was given by Prof. W. B. Scott, of Princeton, and was illustrated by lantern-slides. The wonderful continuity of the American tertiary formations, the vast geographical scale on which they are developed, and the excellent state of preservation of their fossils, was specially insisted upon. Skeletons of many members of the beautifully continuous phylogenetic series were projected on the screen.

Of the lectures held at the general meetings, those of Dr. John Murray and Prof. Milne-Edwards were most interesting to the audiences they addressed. Prof. Milne-Edwards spoke on the extinct avifauna of the Mascarene Islands in its relation to that of certain islands in the Pacific Ocean, and Dr. Murray gave an admirable survey of deep-sea exploration in general.

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